Review of *Propodea* Malaise (Hymenoptera: Tenthredinidae) with descriptions of two new species, three new records from China and a new record from Nepal

Xiaotong WU, Mengmeng LIU, Meicai Wei①

Key Laboratory of Cultivation and Protection for Non-Wood Forest Trees, Central South University of Forestry and Technology, Ministry of Education, Changsha, Hunan 410004, China

Abstract: *Propodea* Malaise, 1945 is reviewed and redescribed. Seven species of *Propodea* are discussed. *Propodea sinica* Wu & Wei sp. nov. and *P. xanthocera* Wu & Wei sp. nov. are described as new to science. *Propodea rotundiventris* (Cameron, 1899), *P. fentoni* (Kirby, 1882) and *Propodea ussuriensis* (Malaise, 1931) are recorded for the first time from China. A key to species of *Propodea* Malaise is also provided. *Tenthredo rufonotalis* Mallach, 1936 is removed from being a junior synonym of *Dipteromorpha ussuriensis* Malaise, 1931. *Propodea rufonotalis* (Mallach, 1936) is a new combination transferred from *Tenthredo*. The species previously recorded as *Propodea rotundiventris* (Cameron, 1899) from China before this paper is a misidentification of *P. sinica* sp. nov. The real *Propodea rotundiventris* (Cameron, 1899) is redescribed based on the holotype and new material. *Propodea spinosa* (Cameron, 1899) is recorded for the first time from Nepal.

Key words: Symphyta; Tenthredininae; taxonomy; key

狭并叶蜂属研究暨中国狭并叶蜂属二新种和三新纪录及尼泊尔一新纪录（膜翅目：叶蜂科）

吴肖彤，柳萌萌，魏美才①

中南林业科技大学经济林培育与保护省部共建教育部重点实验室，湖南 长沙 410004

摘要：狭并叶蜂属 *Propodea* Malaise, 1945 是膜翅目、叶蜂科、叶蜂亚科 1 个小属，已知 5 种。本文记述 7 种，包括 2 个新种：中华狭并叶蜂 *Propodea sinica* Wu & Wei sp. nov. 和 黄角狭并叶蜂 *P. xanthocera* Wu & Wei sp. nov.；黄柄狭并叶蜂 *Propodea rotundiventris* (Cameron, 1899)、大斑狭并叶蜂 *P. fentoni* (Kirby, 1882) 和黑角狭并叶蜂 *Propodea ussuriensis* (Malaise, 1931)是 3 个中国新纪录种，黄翅狭并叶蜂 *Propodea spinosa* (Cameron, 1899) 首次记载分布于尼泊尔。基于新材料详细描述了狭并叶蜂属属征，编制了狭并叶蜂属分种检索表。重新确认 *Tenthredo rufonotalis* Mallach, 1936 是有效种，该种不是 *Dipteromorpha ussuriensis* Malaise, 1931 的次异名，并建立了 1 个新组合：高脊狭并叶蜂 *Propodea rufonotalis* (Mallach, 1936) comb. nov.。曾多次记载分布于中国多地的 *Propodea rotundiventris* (Cameron, 1899) 是错误鉴定，该种是 1 新种，即中华狭并叶蜂 *Propodea sinica* Wu & Wei sp. nov.。基于正模和新采集的材料，重新描述了 *Propodea rotundiventris* (Cameron, 1899)。

关键词：广腰亚目；叶蜂亚科；分类；检索表

Received 20 August 2016. Published 25 December 2016. Published online 28 November 2016.

① Corresponding author, E-mail: weimc@126.com

Introduction

Propodea Malaise, 1945 is a small genus of Tenthredinidae with 5 known species till present. The genus is endemic to East Asia and has been recorded from China, Japan, Korea, Eastern Siberia of Russia, North India and North Myanmar (Malaise 1945; Wei *et al*. 2006; Saini 2007). Malaise (1945) keyed out 4 species of the genus: *P. fentoni* (Kirby, 1882), *P. rotundiventris* (Cameron, 1876), *P. spinosa* (Cameron, 1899), *P. ussuriensis* (Malaise, 1931). Taeger *et al*. (2010) regarded *Propodea* as a subgenus of *Tenthredo* L. and listed only *P. fentoni* (Kirby, 1882) and *P. spinosa* (Cameron, 1899) under this subgenus. *P. rotundiventris* (Cameron, 1876) and *P. ussuriensis* (Malaise, 1931) (replaced by the name of *P. rufonotalis* Mallach, 1936) were placed into the "group" of "*Tenthredo* species not assigned to a subgenus", though the two species were ever clearly placed into the genus *Propodea* by Malaise (1945).

Malaise (1945) firstly recorded *Propodea ussuriensis* (Malaise, 1931) from China and this is also the first record of this genus from China. Wei *et al*. (2002) reported *Tenthredo rotundiventris* (Cameron, 1876) from Henan, Hubei and Hunan Provinces of China. However, this was a misidentification as discussed in this paper. Later, Wei & Lin (2005) recorded *Propodea spinosa* (Cameron, 1899) from Guizhou. Wei *et al*. (2006) listed *Tenthredo rotundiventris* (Cameron, 1876) and *Tenthredo rufonotalis* Mallach, 1936 from China (In this paper, Wei *et al*. regarded *Propodea* as a subgenus of *Tenthredo* L.).

The systematic position of *Propodea* Malaise is uncertain till present. Goulet (1996) simply discussed the subgeneric classification of *Tenthredo* and grouped *Propodea* and many other genera into *Tenthredo* L. Taeger *et al*. (2010) followed the opinion. Wei & Lin (2005), Wei *et al*. (2008, 2016) and Saini (2007) still regarded *Propodea* as a valid genus.

In this paper, 2 new species of this genus are described. *Propodea rotundiventris* (Cameron, 1876) is redescribed. *Propodea rotundiventris* and *P. fentoni* (Kirby, 1882) are recorded from China for the first time. A key to species of *Propodea* Malaise is also provided.

Material and methods

Specimens were examined with a Leica ® S8APO dissection microscope. Adult images were taken with a Nikon® D700 digital camera and a series of images montaged using Helicon Focus (©HeliconSoft), while detailed images were taken with Leica® Z16 APO/DFC550. All images were further processed with Adobe Photoshop CS 6.0.

The terminology of sawfly genitalia follows Ross (1945) and that of general morphology follows Viitasaari (2002).

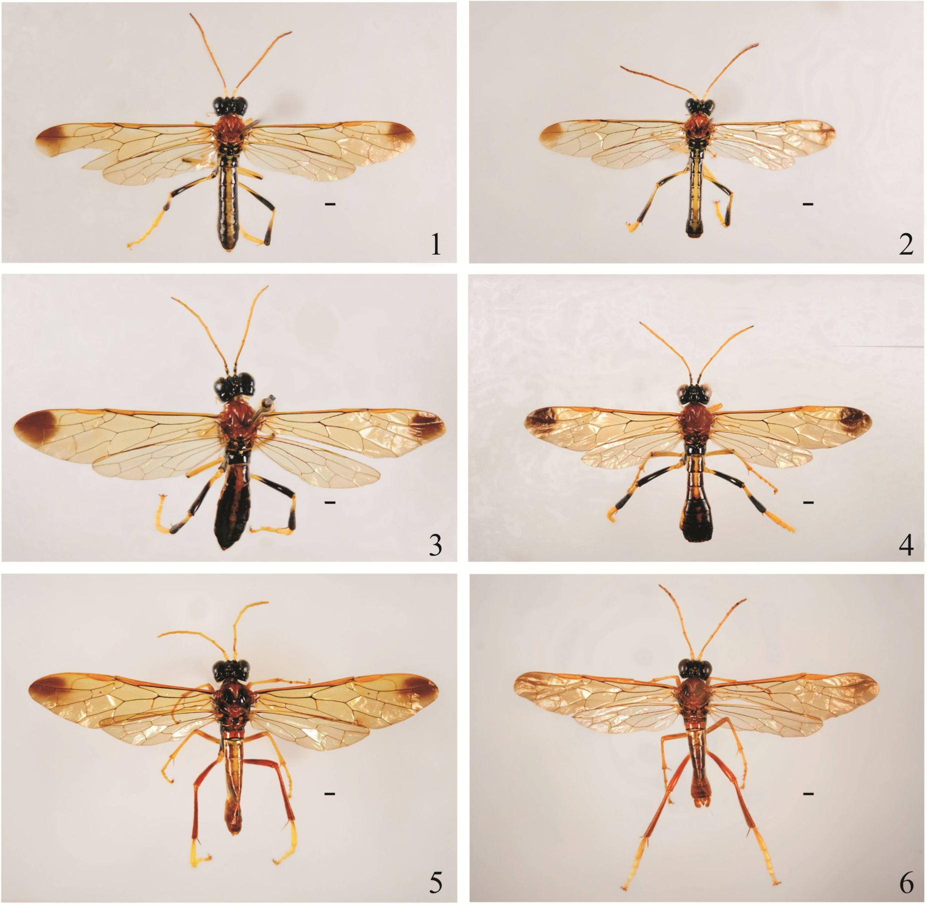
All holotypes and most paratypes of the new species are deposited in the Insect Collection of Central South University of Forestry and Technology, Changsha, Hunan, China (CSCS). Abbreviations of other insect collections are as follows: KUK—Kobe University, Kobe, Japan; NSMT—the National Museum of Nature and Science, Tsukuba, Japan; USNM—National Museum of Natural History, Smithsonian Institution, Washington, DC, USA; NHRS—Natural History Museum, Stockholm, Sweden; BMNH—The British Museum of Natural History, London, England; HNHM—Hungarian Natural History Museum, Budapest, Hungary; SEHU—The Systematic Entomology, Hokkaido University, Sapporo, Japan; SDEI—Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany.

Taxonomy

Propodea Malaise

Propodea Malaise, 1945: 179. New name for *Dipteromorpha* Kirby, 1882, nec. Felder, 1874 [Lepidoptera].

Dipteromorpha Kirby, 1882: 324. Type species: *Macrophya rotundiventris* Cameron, 1876.



Figures 1–6. *Propodea* spp., adults. 1, 2. *P. rotundiventris* (Cameron, 1876); 3, 4. *P. sinica* Wu & Wei sp. nov.; 5, 6. *P. xanthocera* Wu & Wei sp. nov. 1, 3, 5. adult female, dorsal view; 2, 4, 6. adult male, dorsal view. Scale bars = 1 mm.

Diagnosis. Body slender (Figs. 1–6); clypeus flat with distinct anterior incision; labrum broad, apex round and blunt (Fig. 7); left and right mandibles subsymmetric with three inner teeth and a basal lobe (Figs. 10, 11); malar space narrower than diameter of ocellus; eye large, inner margin concaved and strongly convergent downwards, distance much narrower than longest axis of eye and width of clypeus; inner orbit narrow and steep, distance of antennal sockets narrower than width of inner orbit at same height (Fig. 7); supraantennal tubercle long and distinctly elevated, evenly merging with frontal ridge; frons small, open forwards, frontal ridge narrow, flat or blunt; middle fovea and lateral fovea large and deep, open forwards; postocellar area broader than long, seldom as long as broad, at least anterior part elevated, interocellar and postocellar furrows deep; head strongly narrowed behind eyes in dorsal view, temple shorter than half length of eye; occipital carina high, sharp and complete, lower part without fold; hind orbit distinctly narrower than width of eye in lateral view (Fig. 8); antenna slender, filiform, not compressed, 2nd antennomere distinctly longer than breadth, 3rd antennomere longer than 4th antennomere (Fig. 9). Submarginal carina of pronotum elevated, anterior lobe feebly shorter than posterior lobe in lateral view and about 4 times diameter of ocellus; ventral of propleuron broad U-shaped, meeting line shorter than length of prosternum; mesoscutellum strongly elevated, apex cone-shaped; mesoscutellar appendage with obtuse median carina (Figs. 14, 15); mesopleuron flat, both sides nearly parallel; anterior of mesopleuron with small prepectus, anterior of mesepisternum with a long and sharp arc ridge, ventral of mesepisternum with deep transversal furrow and long and sharp ventral spur (Fig. 13); broad katepimeron deeply and largely concaved without anterior lobe of spiracle; metascutellum small and feebly elevated, anterior basin extremely small; cenchrus small, distance 1–2 times as broad as breadth of cenchrus (Fig. 14); metapostnotum oblique, median carina elevated; metepimeron extremely narrow, posterior margin and corner not protruding backwards. Abdomen cylindrical, 1st tergite smooth, without median suture (Fig. 16), distinctly broader than following tergites. Leg slender, fore inner tibial spur broadly furcate at apex; hind coxa short, femur slender, shorter than tibia (5 : 6), not reaching end of abdomen; hind inner tibial spur 1.5–2 times as long as apical breadth of hind tibia, about half length of metabasitarsus, metabasitarsus about as long as following 3 tarsomeres together, tarsal pulvillus extremely small; claw cleft, without basal lobe (Fig. 12). Veins of *Tenthredo* type, pterostigma slender, R+M not shorter than cu-a, sub-apex of 2r strongly curved, cell 2Rs longer than 1R1 and 1Rs together, cu-a meeting cell 1M at basal 6-8th, anal crossvein basad of basal 1/3 of anal cell; cells Rs and M in hind wing closed, anal cell sessile (Figs. 1–6).

Discussion. *Propodea* can be easily recognized from *Tenthredo* s. str. by the abdomen cylindrical with the first segment (propodeum) undivided and highly polished, the extremely strong and sharp, flattened mesosternal thorns, and the anteriorly strongly carinate mesopleura.

Distribution. East Asia.

The 7 known species of the genus can be identified by following key.

Key to known species of *Propodea* Malaise

1. Forewing with a distinct apical smoky macula, without distinct yellow tinge; hind femur and tibia largely black, if hind femur reddish brown, then mesepisternum coarsely and densely punctured without smooth interspaces·· 2

-. Forewing without apical smoky macula, or with a small and faint macula; hind femur and tibia reddish brown (tibia seldom dark brown); mesopleuron flat and smooth with large, round, isolated punctures, interspaces distinct, smooth (head black, clypeus yellowish white; thorax usually black)·························· 6

2. Mesopleuron coarsely and densely punctured, anterior arc carina obtuse; antenna distinctly shorter than length of abdomen; apex of abdomen black; dorsum of thorax reddish brown, mesoscutal lateral lobe with black spots·· 3

-. Mesopleuron surface smooth with weak microsculptures and large, deep and isolated punctures, anterior arc carina sharp; antenna not shorter than length of abdomen; dorsum of abdomen black with a median yellow longitudinal stripe (apex of forewing with one small roundish brown spot)·· 5

3. Head and clypeus black, labrum and mandible largely yellowish white; apical macula of forewing small and roundish, remote from pterostigma··· 4

-. Head pale brown with a large black frontal spot, clypeus yellowish white; forewing strongly smoky beyond pterostigma. China, Russia, Korea and Japan··· *P. fentoni* (Kirby)

4. Posterior part of postocellar area and posterior end of lateral furrows much more strongly concave with marginal carina very sharp and high; entire scape and basal half of pedicel yellowish white, flagellum pale brown; supraantennal tubercle narrow and high, distinctly elevated, middle fovea narrow and deep, middle of frons area distinctly concaved, frontal ridge distinct. (1st tergite entirely black, occasionally with small lateral brown spot). China··· *P. rufonotalis* (Mallach)

-. Posterior part of postocellar area and posterior end of lateral furrows not specially concave with marginal carina quite low and weak; entire antenna black, or black brown; supraantennal tubercle feebly elevated, middle fovea broad and shallow, frontal ridge blunt. China, East Siberia and Japan··································· ·· *P. ussuriensis* (Malaise)

5. Two basal antennomeres yellowish white, flagellum yellowish brown; mesoscutellar appendage smooth and with a faint middle ridge, without punctures and microsculptures; ventral part of mesepisternum black, middle and lateral of 1st tergite pale; annular pilose bands in female lancet as broad as distance between pilose bands; penis valve as Fig. 22. China and India····································· *P. rotundiventris* (Cameron)

-. Basal 2 antennomeres largely or entirely black or black brown, outside of third antennomere with a faint black brown stripe, flagellum otherwise pale brown or yellow brown; mesoscutellum with distinct median carina, punctures and microsculptures; mesepisternum entirely reddish brown; 1st tergite entirely black; annular pilose bands in female lancet narrower than distance between pilose bands; penis valve as Fig. 39. China·· *P. sinica* Wu & Wei **sp. nov.**

6. About basal 3 antennomeres black; forewing without apical smoky spot; notum of thorax entirely black; postocellar area strongly elevated, distinctly above top of ocelli; valviceps of penis valve short and roundish, not distinctly protruding dorsal-apically. China and India···*P. spinosa* (Cameron)

-. Antenna entirely yellowish brown; forewing with an obscure apical smoky spot; postocellar area weakly elevated, not above top of ocelli; valviceps of penis valve elongate and strongly protruding dorsal-apically (Fig. 57). China·· *P. xanthocera* Wu & Wei **sp. nov**.

1. ***Propodea rotundiventris* (Cameron, 1876)** (Figs. 1, 2, 7–23), new record to China

Macrophya rotundiventris Cameron, 1876: 465.
Dipteromorpha rotundiventris: Kirby, 1882: 324.
Propodea rotundiventris: Malaise, 1945: 181.

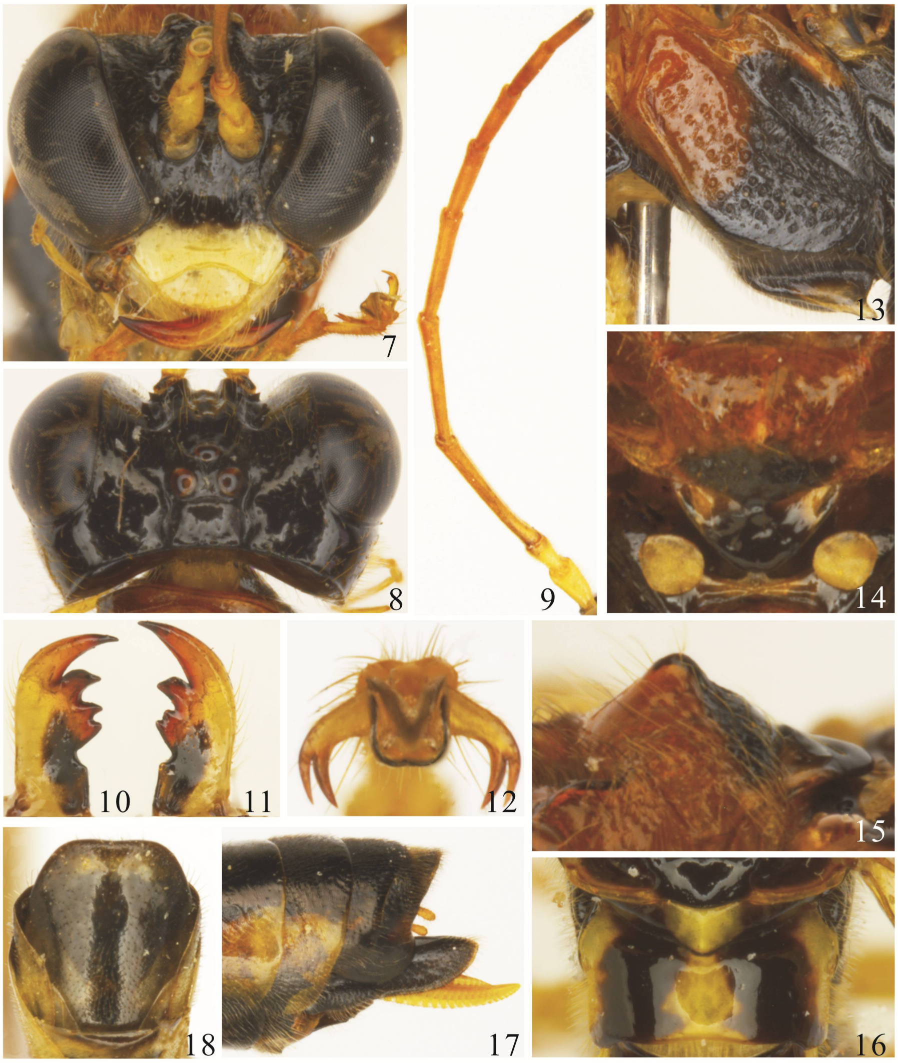
Description. Female (Fig. 1). Body length 14.5 mm. Head black, clypeus, labrum, most of mandible, labium, palp and lower margin of malar space yellowish white (Figs. 7, 10, 11); two basal antennomeres yellowish white, flagellum yellowish brown (Fig. 9). Thorax black, pronotum except anterior ventral corner, mesonotum except posterior triangle spot of mesoscutellum and middle of mesoscutellar appendage, large elliptical macula on upper of mesepisternum, dorsal margin of mesepimeron reddish brown, middle of metapostnotum with a small yellow dot, apex of ventral spur of thorax white (Figs. 13–15). Abdomen black, lateral fold of 1st–8th tergites, 2nd–4th sternites and a narrow middle longitudinal stripe on each of tergites yellowish brown, sheath black, cercus yellowish brown (Fig. 17). Leg yellow, each coxa except apical margin, a dorsal apical spot of middle femur, most of hind femur, basal half of hind tibia black. Wings hyaline with brown tinge and a small roundish apical smoky macula, covering apical half of cell 3R1, apical margin of 2Rs and entire 3Rs, vein C and pterostigma yellowish brown, other veins largely black brown (Fig. 1). Body hairs on dorsum of head and thorax brown, hairs on pleuron silver, setae on sheath pale brown.

Body shiny; clypeus smooth, labrum shallowly and sparsely punctured, base of mandible sparsely and coarsely punctured; frontal area, inner orbit, temple and postocellar area obscurely and irregularly rugose, postorbit shallowly and sparsely punctured (Figs. 7, 8). Pronotum largely smooth, dorsal margin with shallow punctures; prescutum feebly but distinctly punctured, scutum largely smooth; anterior slope of mesoscutellum largely smooth, sides with some large punctures, posterior slope with coarse punctures (Figs. 14, 15); mesoscutellar appendage and metascutellum smooth, upper posterior area of arc ridge on mesepisternum with large and isolated punctures, diameter of each puncture smaller than radius of ocellus, interspaces smooth, 3–4 times as long as diameter of punctures, lower area densely punctured, interspaces narrow and with microsculptures, anterior and ventral of mesepisternum with fine and dense microsculptures, impunctate; lower area of mesepimeron densely microsculptured (Fig. 13); metapleuron weakly microsculptured. 1st tergite highly smooth, impunctate (Fig. 16), 2nd tergite finely and weakly microsculptured, other tergites densely and finely microsculptured, feebly shiny. Sheath finely and densely microsculptured, dim (Fig. 17).

Body quite slender. Anterior incision of clypeus roundish, broad and shallow, with depth about one fourth length of clypeus; eye large, distance between eyes below about 0.6 times longest axis of eye (18 : 31) (Fig. 7); frons distinctly below top of eyes; supraantennal tubercles obtusely elevated, distance between them distinctly broader than height; frontal ridge feebly elevated, frontal basin indistinct; POL : OOL : OCL = 9 : 20 : 15; postocellar area obtusely elevated, distinctly broader than long (23 : 14), without median ridge or median furrow; lateral furrows quite deep and curved, convergent backwards; head strongly narrowed behind eyes in dorsal view, temple about 0.4 times length of eye; occipital carina sharp (Fig. 8). Antenna as long as abdomen, slightly shorter than vein C, 3rd antennomere distinctly longer than 4th (57 : 47) (Fig. 9). Mesoscutellum cone-shaped elevated, with short but acute peak, without transversal or longitudinal carina; mesoscutellar appendage with an obscure median ridge (Figs. 14, 15). Inner tooth of claw distinctly longer and broader than outer tooth (Fig. 12). Ovipositor sheath feebly shorter than metabasitarsus, apical sheath about as long as basal sheath, dorsal apical corner distinct (Fig. 17). Lancet with 23 serrulae, middle serrulae weakly and obliquely elevated, distinctly broader than intermediate cypsella, with one large proximal subbasal tooth and five to seven smaller distal subbasal teeth, median annular spines bands rather broad, slightly broader than distance between annular spines bands, sclerora feebly higher than width (Fig. 20), 9th–11th serrulae as shown in Fig. 21.

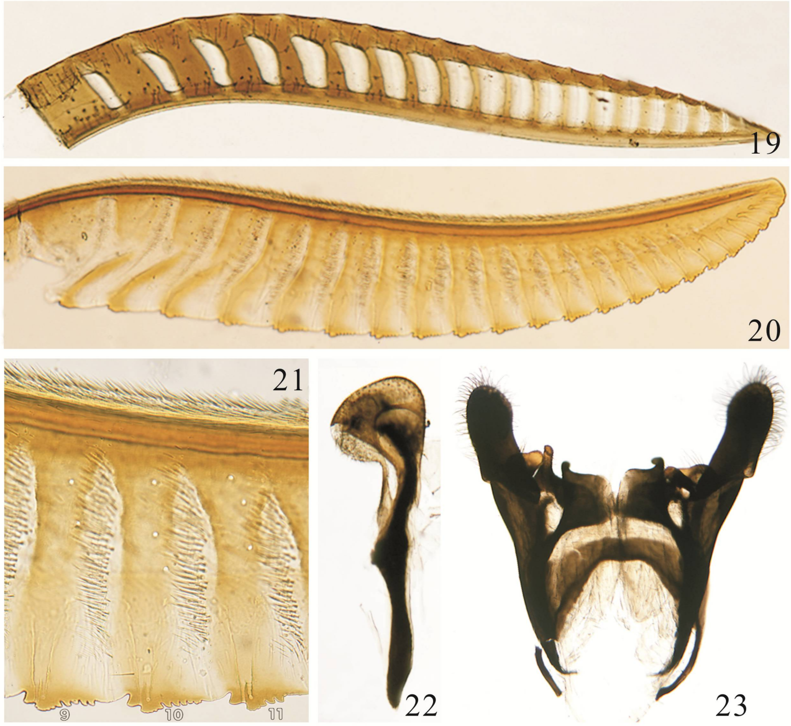
Male (Fig. 2). Body length 12.5mm. Body color and structure similar to female except for: flagellum brown, postocellar area about 2 times broader than long, temple extremely short in dorsal view, about 0.25 times length of eye, mesoscutellum largely and mesoscutellar appendage entirely black, 5th–7th sternites yellowish brown, ventral of hind tibia and tarsomeres densely furry; subgenital plate as broad as long, apical margin truncate (Fig. 18); harpe 2.6 times longer than width, apical margin obtusely round (Fig. 23); parapenis short and broad, 1.3 times higher than median width; penis valve as shown in Fig. 22.

Type specimen examined. Holotype. ♂, [left flagellum missing] "Type H. T."; "B. M. TYPE HYM. 1.239"; "*Macrophya rotundiventris* Type, Cameron"; "Kb. T. 17 f 1."; "Masuri [North India], 7000, June".



Figures 7–18. *Propodea rotundiventris* (Cameron, 1876). 7. Head of female, anterior view; 8. Head of female, dorsal view; 9. Antenna of female; 10. Left mandible; 11. Right mandible; 12. Claw; 13. Mesopleuron; 14. Mesoscutellum and mesoscutellar appendage, dorsal view; 15. Mesoscutellum and mesoscutellar appendage, lateral view; 16. 1st tergite, dorsal view; 17. Ovipositor sheath, lateral view; 18. Subgenital plate, ventral view.

Other specimens examined. 3♀, **China,** Xizang, Medog 60K, 2937 m, 18-VI-2009, Meicai WEI leg.; 1♀4♂, Xizang, Nyingchi, Medog 40K, 2750 m, 13-VII-2013, Meicai WEI, Gengyun NIU, Wei XIAO, Tao LI, Ping HU, Yihai ZHONG leg.; 1♀1♂, Xizang, Rikaze, Yadong, 3600 m, 20-VII-2013, Meicai WEI, Gengyun NIU, Wei XIAO, Tao LI leg. (CSCS). 1♀, **India**, data unrecorded (NSMT). 1♀, Sikkim, *Propodea rotundiventris* (Cameron), Malaise, 51 (NHRS). 1♀, Uttar Pradesh, Mandal, 2200 m, 17-VI-1994, M. S. Saini; 1♀, Himachal Pradesh: Kalatop, 2424 m, 26-VI-1991, M.S. Saini; 1♀1♂, Kalatop, (H. P.), 10.8.82, M. S. Saini. (USNM).



Figures 19–23. *Propodea rotundiventris* (Cameron, 1876). 19. Lance; 20. Lancet; 21. The 9th–11th serrulae; 22. Penis valve; 23. Gonoforceps.

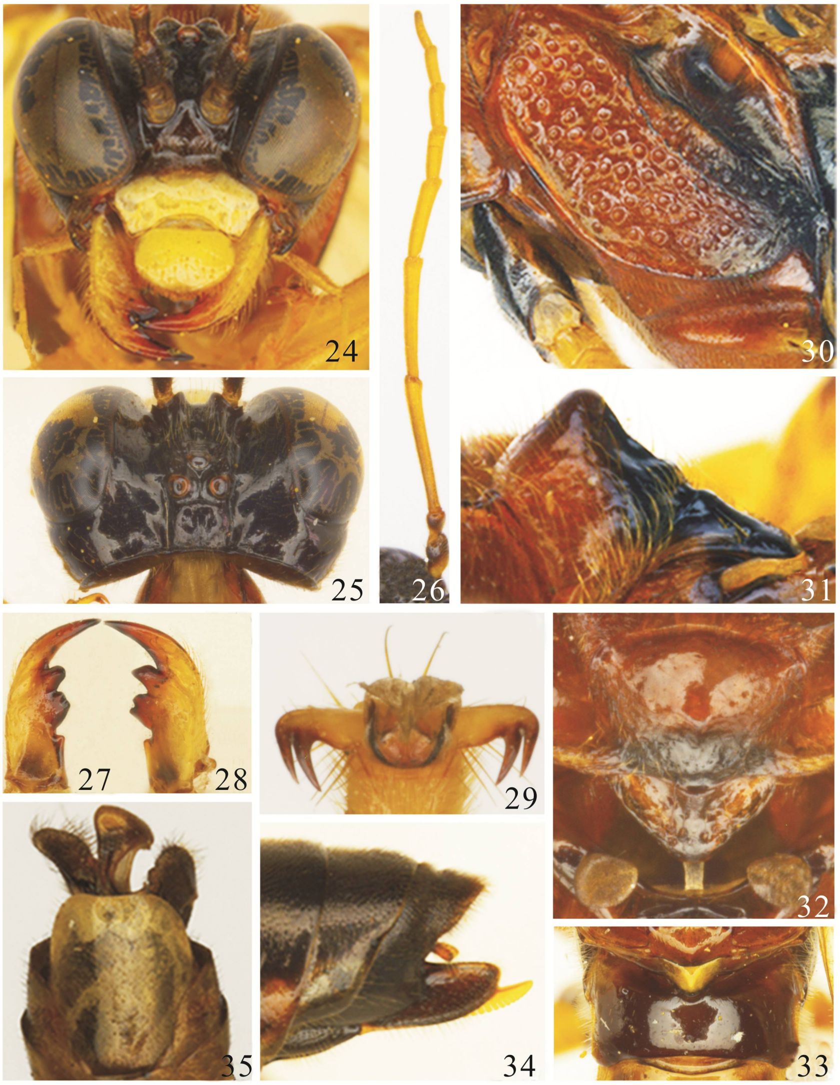
Distribution. China (Xizang); India (North).

Remarks. This species is similar to *P. sinica* sp. nov. See the remarks under the description of *P. sinica* sp. nov. for the differences between them.

Combination of following characters can distinguish P. rotundiventris from other species: the forewing with a small but distinct apical roundish smoky macula, mesepisternum flat with large and isolated punctures, hind femur largely black, two basal antennomeres yellowish white, flagellum yellowish brown or pale brown.

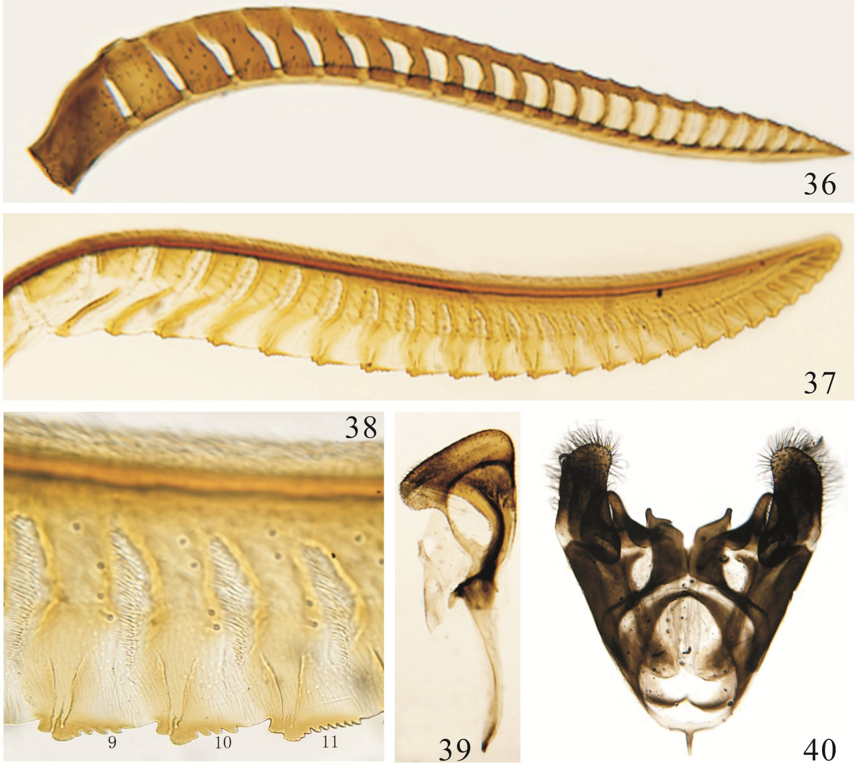
2. ***Propodea sinica* sp. nov.** (Figs. 3, 4, 24–40)

Description. Female (Fig. 3). Body length 16–17mm. Head shiny black, clypeus, labrum, mandible largely, labium, palp and malar space yellowish white (Figs. 24, 27, 28); antenna yellowish brown, basal 2 antennomeres and a narrow longitudinal stripe on outer of 3rd antennomere black brown (Fig. 26); thorax reddish brown, triangle spot on posterior of mesoscutellum, middle of mesoscutellar appendage, metascutellum largely, lower of propleuron, posterior corner of mesopleuron and metapleuron black (Figs. 30–32); abdomen black, lateral of 1st tergite with a minute and round yellowish white spot, median longitudinal stripe, lateral margins of 2nd–7th tergites and sternites entirely pale yellowish brown, sheath black, cercus pale brown (Fig. 34). Leg pale yellowish brown, all coxae black, middle femur with a small black brown spot on posterior of apex, hind femur except basal fifth and apical half of hind tibia black. Wing hyaline with brownish tinge, forewing with a sharp and roundish smoky apical spot, covering apical half of cell $3R_1$, anterior apical corner of 2Rs and entire 3Rs, costa and pterostigma yellow brown, other vein largely black brown (Fig. 3). Body hairs and setae on sheath pale brown.



Figures 24–35. *Propodea sinica* Wu & Wei sp. nov. 24. Head of female, anterior view; 25. Head of female, dorsal view; 26. Antenna of female; 27. Left mandible; 28. Right mandible; 29. Claw; 30. Mesopleuron; 31. Mesoscutellum and mesoscutellar appendage, lateral view; 32. Mesoscutellum and mesoscutellar appendage, dorsal view; 33. The 1st tergite, dorsal view; 34. Ovipositor sheath, lateral view; 35. Subgenital plate, ventral view.

Labrum, postorbit and dorsum of head smooth without distinct punctures or microsculptures (Figs. 24, 25), base of mandible sparsely punctured (Figs. 27, 28); lateral of pronotum distinctly microsculptured; mesonotum with extremely sparse and small punctures and shiny, posterior of lateral lobe, parapsis, lateral of mesoscutellum and mesoscutellar appendage distinctly punctured (Figs. 31, 32); posterior area of arc ridge on mesepisternum sparsely and largely punctured, diameter of large punctures slightly smaller than radius of ocellus, interspaces glossy, about equal to large punctures, anterior and ventral of mesepisternum finely microsculptured and weakly shiny (Fig. 30); mesepimeron and metapleuron finely microsculptured and obscurely punctured, shiny. 1st tergite smooth (Fig. 33), other tergites finely microsculptured, several apical tergites with punctures; sheath distinctly microsculptured (Fig. 34).



Figures 36–40. *Propodea sinica* Wu & Wei sp. nov. 36. Lance; 37. Lancet; 38. The 9th–11th serrulae; 39. Penis valve; 40. Gonoforceps.

Body slender (Fig. 3). Depth of anterior incision of clypeus about one third length of clypeus, lateral lobe broad; distance between eyes about half longest axis of eye (Fig. 24); malar spaces about as long as radius of ocellus; frons distinctly below top of eyes; supraantennal tubercles roundly and obtusely elevated, distance between tubercles distinctly broader than height of a tubercle, evenly merging with frontal ridge; middle fovea broad and deep, connecting with frontal basin, lateral fovea deep furrow-shaped; interocellar and postocellar furrows distinct; POL : OOL : OCL = 3 : 9 : 8; postocellar area feebly elevated anteriorly and concave posteriorly, 1.2 times as broad as long without distinct median furrow or ridge; lateral furrows deep, long and feebly curved, subparallel; head strongly narrowed behind eyes in dorsal view, temple 0.45 times as long as eye; occipital carina extremely sharp without dorsal incision (Fig. 25). Antenna shorter than length of abdomen, 3rd antennomere distinctly longer than 4th antennomere (27 : 23) (Fig. 26). Mesoscutellum cone-shaped elevated with a short but distinct peak, posterior slope with obtuse median ridge; mesoscutellar appendage with low but distinct median ridge (Figs. 31, 32); middle of metapostnotum keel-like elevated, distinctly higher than 1st tergite; mesepisternum with sharp arc ridge, both sides parallel in frontal view, surface flat; lateral furrows of mesosternum deep (Fig. 30). Claw without basal lobe, inner tooth clearly longer than outer tooth (Fig. 29). Sheath as long as metabasistarsus, apical sheath feebly longer than basal sheath, apex narrow and round in lateral view. Lancet with 25 serrulae, middle of serrulae feebly and obliquely elevated with one large proximal subbasal tooth and seven to eight smaller distal subbasal teeth, cypsella shorter than half length of serrula, annular spines bends narrow and distinctly shorter than distance between annular spines bands, sclerora broader than height (Fig. 37), 9th–11th serrulae as Fig. 38.

Male (Fig. 4). Body length 14–16 mm. Body color and structure similar to female except for: ventral of hind tibia and tarsomeres densely furry, metatarsomere distinctly compressed; subgenital plate feebly longer than width, apical margin obtusely truncate; harpe arc-curved, 2 times higher than width, apex obtusely round; parapenis narrow, 2 times higher than median width; gonoforceps as shown in Fig. 40; penis valve as shown in Fig. 39.

Holotype. ♀, **China,** Henan, Song County, Mt. Baiyunshan, 1685 m, 17-VIII-2008, Xiaohua WANG leg. **Paratypes.** 1♂, **China**, Gansu, Mt. Xiaolongshan, 1600 m, 16-VII-2010, Heng XIN leg.; 1♀, Anhui, Mt. Huangshan, 15-VIII-1936, K. Z. CHEN leg.; 1♀, Henan, Nei Village, Baotianman, 1600 m, 15-VII-1998, Meicai WEI leg.; 2♀, Henan, Xixia, Mt. Laojieshan, 1500 m, 17–19-VII-1998, Suping SUN, Wei XIAO leg.; 1♂, Henan, Song County, Mt. Baiyunshan, 1800 m, 24-VII-2001, Yihai ZHONG leg.; 3♀1♂, Henan, Song County, Mt. Baiyunshan, 1650 m, 19-VII-2002, Jigang JIANG leg.; 1♀, Henan, Song County, Mt. Baiyunshan, 1500 m, 18-VII-2003, Minwen LIANG leg.; 1♂, Henan, Song County, Mt. Baiyunshan, 1300–1400 m, 14-VII-2004, Weixing LIU leg.; 1♀1♂, Henan, Song County, Mt. Baiyunshan, 1685 m, 17-VIII-2008, Fu ZHAO, Xiaohua WANG leg.; 1♀, Henan, Song County, Mt. Baiyunshan, 896 m, 17-VIII-2008, Tao LI leg.; 2♀, Henan, Lushi, Dakuaidi, 1700 m, 20-VII-2001, Yihai ZHONG leg.; 1♀, Henan, Lushi, Shiziping, 1500 m, 22-VIII-2008, Jianhua HUANG leg.; 1♀, Hubei, Shennongjia, Hongping, 1700 m, 16-VIII-1983, Gentao JIN, Zuyao LIU leg.; 1♀, Hubei, Shennongjia, Honghuaduo, 1200 m, 03-VII-2007, Meicai WEI leg.; 1♀, Hubei, Shennongjia, Hongping, 1867 m, 17-VII-2009, Fu ZHAO leg.; 1♂, Hubei, Shennongjia, Hongping, 2500 m, 06-VIII-2015, Xing LV leg.; 1♀2♂, Hubei, Shennongjia, Jizi Valley, 2000 m, 08-VIII-2015, Wei XIAO leg.; 1♀, Hunan, Mt. Tianpingshan, 08-VIII-1981, (Dingyuan)WEN, HE leg.; 1♀, Sichuan, Jiuzhai Valley, Rize Valley, 03–04-VIII-2002, Fuming SHI leg.; 1♀, Sichuan, Mt. Wawushan, Guoxian Bridge, 1750 m, 11-VIII-2007, Fei LIU leg. (CSCS).1♂, Shaanxi, Foping-x, Dadianzi, 1850–2000 m, 5 km N of Donghetai, 08-VII-1997, T. Yagi col. (KUK); 1♂, Shaanxi: Foping-x, Dadianzi, 1650–1800 m, 5 km N of Donghetai, 02-VII-1997, T. Nakanishi col. (KUK).

Distribution. China (Gansu, Shaanxi, Anhui, Henan, Hubei, Hunan, Sichuan).

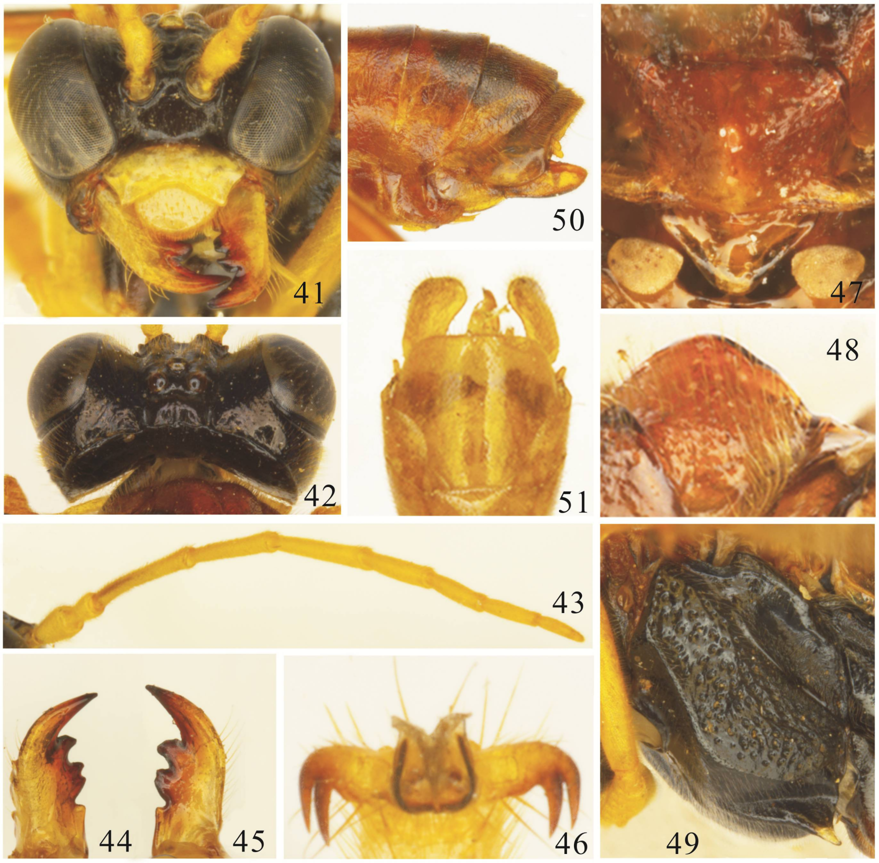
Etymology. This species epithet is named as *sinica* as it is distributed widely in China.

Remarks. This new species was misidentified as *P. rotundiventris* Cameron (Wei *et al*., 2006, 2008). *P. sinica* differs from *P. rotundiventris* in the basal antennomeres black, mesopleuron almost entirely reddish brown, the 1st tergite black; the annular spines bands narrow and distinctly shorter than distance between annular spine bands; sclerora broader than height; harpe 2 times longer than width; parapenis 2 times higher than median width, apex of valviceps almost transversal, apex of valvura with a distinct platform. In *P. rotundiventris*, the basal antennomeres yellowish white; the lower half of mesopleuron black, the middle and lateral of 1st tergite yellowish white; the annular spine bands distinctly broader than the distance between annular spines bands, sclerora higher than width; harpe 2.6 times higher than width, parapenis 1.3 times higher than median width; the apex of valviceps roundish, apex of valvura without a platform.

3. ***Propodea xanthocera*** **Wu & Wei sp. nov.** (Figs. 5, 6, 41–57)

Description. Female (Fig. 5). Body length 16.5 mm. Head shiny black; clypeus, labrum, mandible largely, palp and malar space yellowish white (Figs. 41, 44, 45). Antennae entirely yellow brown (Fig. 43). Posterior of pronotum, mesonotum and metanotum reddish brown, longitudinal stripe on lateral of mesonotum, posterior margin of mesoscutellar appendage, a small convex plate lateral to cenchrus and entire pleuron black (Figs. 47–49). Abdomen dark yellowish brown, narrow posterior margin of 1st tergite black, spot anterior to spiracle on 2nd tergite yellowish white, dorsum of 2nd–5th tergites black brown with central pale stripe, 6nd–10th tergites brown, sheath (margin brown) and cercus yellowish brown (Fig. 50). Fore leg and middle leg pale yellowish brown, coxae largely black, hind femur, tibia and tibial spur reddish brown, tarsomere yellowish white. Wing hyaline with faint yellowish tinge, apex of forewing with a small and elliptical smoky spot, covering posterior half of cell 3R1, apical upper corner of 2Rs and upper half of 3Rs, costa and pterostigma yellowish brown, other veins largely black brown (Fig. 5). Body hairs and setae pale brown.

Head smooth, labrum with small and sparse punctures, base of mandible with large but obscure punctures, frons faintly and finely microsculptured, middle and lower of postorbit with small punctures, postocellar area and temple shallowly punctured (Figs. 41, 42, 44, 45). Anterior lobe of pronotum distinctly microsculptured, posterior of pronotum densely punctured along margin; mesonotum smooth, anterior of prescutum with small and sparse punctures, posterior of prescutum densely microsculptured, inner margin of lateral lobe finely and densely punctured; lateral of mesoscutellum and parapsides distinctly microsculptured and obscurely punctured (Fig. 47, 48); mesoscutellar appendage and metascutellum smooth; posterior of arc ridge on mesepisternum with large and isolated punctures, diameter of punctures about equal to radius of ocellus, interspaces of punctures narrow and feebly microsculptured, anterior area of mesepisternum distinctly microsculptured, mesepimeron densely microsculptured (Fig. 49); upper half of metepisternum coarsely and densely punctured, lower half smooth, metepimeron densely microsculptured. 1st tergite smooth, other tergites finely microsculptured; sheath finely microsculptured (Fig. 50).

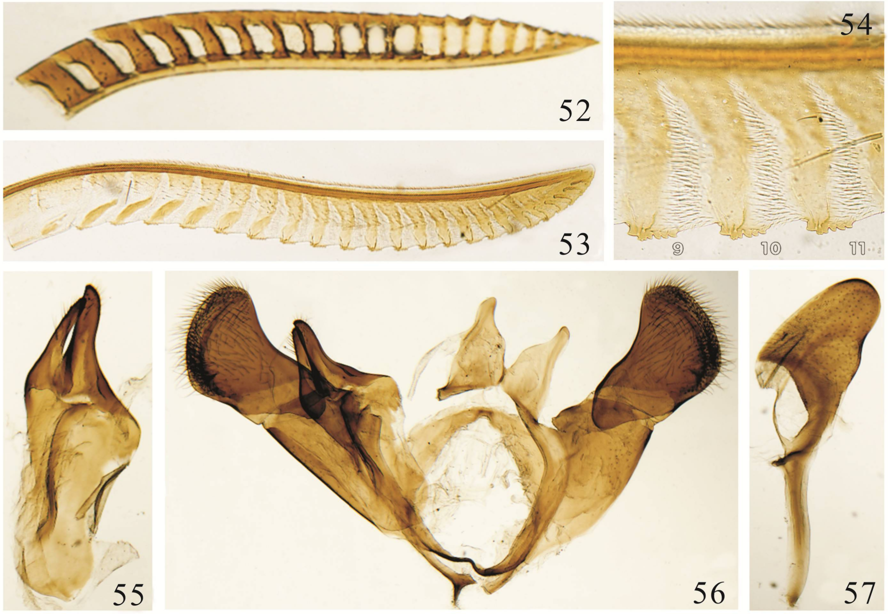


Figures 41–51. *Propodea xanthocera* Wu & Wei sp. nov. 41. Head of female, anterior view; 42. Head of female, dorsal view; 43. Antenna of female; 44. Left mandible; 45. Right mandible; 46. Claw; 47. Mesoscutellum and mesoscutellar appendage, dorsal view; 48. Mesoscutellum and mesoscutellar appendage, lateral view; 49. Mesopleuron; 50. Ovipositor sheath, lateral view; 51. Subgenital plate, ventral view.

Body slender (Fig. 5). Labrum broad, apex round; anterior incision of clypeus very broad, shallower than two fifths length of clypeus, lateral lobe of clypeus a short triangle, apex somewhat acute; eye large, distance between eyes about half longest axis of eye; malar space about equal to radius of ocellus (Fig. 41); supraantennal tubercles obtusely elevated; middle fovea broad and deep, bottom flat, connecting with frontal basin, lateral fovea broad sulciform; frons below top of eyes, middle concaved, frontal ridge obtuse; interocellar furrow broad and deep, extending forwards and distinctly bent, postocellar furrow broad and deep; POL : OOL : OCL = 3 : 11 : 9; postocellar area weakly elevated, without distinct median carina, not above top of ocelli, 1.6 times as broad as long; lateral furrows broad, deep and weakly curved, subparallel backwards; head strongly narrowed behind eyes in dorsal view, temple about one third length of eye; occipital carina sharp and complete, end of lateral furrow feebly concaved with a V-shaped incision at middle of posterior carina in postocellar area (Fig. 42). Antenna shorter than length of abdomen, 3rd antennomere distinctly longer than 4th (31 : 22) (Fig. 43). Mesoscutellum cone-shaped elevated, with distinct median carina and roundish peak;

appendage with obtuse median carina (Figs. 47, 48); posterior of metascutellum distinctly elevated, protruding backwards; center of metapostnotum distinctly elevated, but below metascutellum and above 1st tergite; mesepisternum with sharp arched ridge, both sides parallel in frontal view, surface flat (Fig. 49); lateral furrows of mesosternum deep and long. Metabasitarsus indistinctly incrassated, as long as following three tarsomeres together; claw without basal lobe, inner tooth longer than apical tooth (Fig. 46). Ovipositor sheath distinctly shorter than metabasitarsus (35 : 43), apical sheath 1.5 times as long as basal sheath, dorsal apical corner feebly protruding in lateral view (Fig. 50). Lancet with 23 serrulae, weakly elevated, hardly longer than flat intermediate cypsella, with one large proximal subbasal tooth and six to eight smaller distal subbasal teeth, median annular spine bands about as broad as distance between annular spines bands, sclerora slightly broader than height (Fig. 53); 9th–11th serrulae as shown in Fig. 54.

Male (Fig. 6). Body length 13mm; body color and structure similar to female except for: apical macula on forewing weak and obscure; eyes much protruding, malar space 0.3 times longer than diameter of ocellus; hind tarsomeres compressed, ventral hairs dense and long; subgenital plate slightly broader than long, apex truncate; harpe 2.2 times longer than median breadth, apex bluntly oblique; parapenis narrow, 2.1 times longer than median breadth, dorsal process indistinctly bent; volsella and digitus of gonolacinia slender (Figs. 55, 56); valviceps distinctly oblique and strongly protruding dorsal-apically, apex round (Fig. 57).



Figures 52–57. *Propodea xanthocera* Wu & Wei sp. nov. 52. Lance; 53. Lancet; 54. The 9th–11th serrulae; 55. Volsella; 56. Gonoforceps; 57. Penis valve.

Holotype. ♀, **China,** Henan, Song County, Mt. Baiyunshan, 1500 m, 18-VII-2003, Minwen LIANG leg. **Paratypes.** 1♀, **China**, Gansu, Tianshui, Mt. Taiyangshan, 13-VI-2008, Hui FAN leg.; 2♀, Gansu, Jiyuan Forest Plantation, Jinhe Area, 1850 m, 23-VII-2009, Yali

YANG leg.; 1♂, Shaanxi, Foping-x, Liangfeng Gallery Top, 18-VI-2014, Meicai WEI leg. (CSCS). 1♂, Shaanxi, Foping-x, Bridge 3 km north-west of Donghetai, 1500 m, 25-VI-1997, T. Saigusa col. (KUK); 1♀1♂, Shaanxi, Zuoshui-x, Yingpan-Linchang, 1850 m, 22-VII-1997, T. Yagi col. (KUK); 1♀, Shaanxi, Zuoshui-x, Brook nr tunnel, Hetaoping, 1650–1700 m, 10-VII-1997, H. Shima col. (KUK); 2♀, Shaanxi, Foping, Dadianzi, 1650–1800 m, 5 km north of Donghetai, 02-VII-1997, T. Yagi & A. Nakanishi col. (KUK).

Distribution. China (Gansu, Shaanxi, Henan).

Etymology. The species epithet refers to the yellow brown antenna.

Remarks. This species is similar to *P. spinosa* (Cameron, 1899) except for: the antenna entirely yellowish brown; the apex of forewing with a small and obscurely boundaried smoky macula; notum of thorax reddish brown, the mesoscutal lateral lobe with two black spots; the postocellar area slightly elevated, not above top of ocelli; valviceps of male penis valve distinctly oblique and strongly protruding. In *P. spinosa*, the basal three antennomeres black brown; the apex of forewings without distinct smoky spot; notum of thorax entirely black; the postocellar area strongly elevated, distinctly above top of ocelli; the apex of the penis valve obtusely truncate, not strongly protruding.

4. ***Propodea fentoni*** **(W. F. Kirby, 1882),** new record to China

Tenthredo fentoni W.F. Kirby, 1882: 304.

Jermakia spinifera Mocsáry, 1909: 19.

Tenthredopsis hakiensis Matsumura, 1912: 42.

Type specimen examined. *Jermakia spinifera* Mocsáry, 1909, **Syntypes.** ♀♂. Type localities: “Sibiria orientalis: Ussuri (Kasakewitsh) et Raddefka”. **Syntypes.** 1♀, “Sibiria or. Raddefka” [= Russia: Birobidzhan: Radde]; 1♂, “Ussuri Kasakewitsch” [= Russia: Khabarovskiy Kray: Kazakevichevo] (HNHM) Examined. 1♀, holotype of *Tenthredo hakiensis*: “9/VIII, 1914, Hagi; 17”; “*Tenthredopsis hakiensis* Mats., Type”; “*Propodea fentoni* (Kirby), det. M. Wei, 2014.” (SEHU). Holotype of *Tenthredo fentoni* W. F. Kirby, 1882 not examined.

Other specimens examined. 1♀, **China,** Jilin, Mt. Changbaishan, 05-VIII-2008, Maoling SHENG leg.; 2♀3♂, Jilin, Songjiang River, Qianchuan Forestry Station, 890 m, 09-VIII-2014, Biao CHU leg.; 1♀, Liaoning, Kuandian, 10-VII-2007, Maoling SHENG leg. (CSCS). 1♀, [**JAPAN:** Hokkaido] Kogen-onsen, Mts. Dajsetsuzan, Kamikawa, 11-VII-1996, A. Shinohara; 1♀, Mongakudaira, Tateshina, Nagano, 21–24-VIII-1992, A. & T. Shinohara; 1♂, Kakuma, Sanada, Nagano Pref., 14–15-VII-1982, Hideho Hara (SEHU).

Distribution. China (Jilin, Liaoning); Russia (Vladivostok); Korea; Japan.

Remarks. This species can be easily recognized by the forewing with a large smoky macula covering entire apical third of forewing; the head is yellow brown with a black frontal macula.

5. ***Propodea ussuriensis*** **(Malaise, 1931)**, new record to China

Dipteromorpha ussuriensis Malaise, 1931: 103.

Type specimen examined. 1♀ (Holotype), “10/8”; “Vladivostok, Sedanka, Malaise”; “Typus” (red); “*Jermakia ussuriensis* n. sp., Malaise det.” (NHRS). 1♀ (Paratype), “2/8”; “Vladivostok, Sedanka, Malaise”; “Paratypus” (red); “*Dipteromorpha ussuriensis* n. sp., Malaise det., 1931”. 1♂ (Paratype), “1/8”; “Vladivostok, Sedanka, Malaise”; “Paratypus” (red); "*Dipteromorpha ussuriensis* n. sp., Malaise det., 1935". (NHRS).

Other specimens examined. 1♀, **China,** Liaoning, Haicheng, Sanjiabao Jiulongchuan, 620 m, 08-VII-2015, Zejian LI leg.; 1♀, Jilin, Fusong, Songjianghe Town, 890 m, 10–12-VIII-2014, Zejian LI leg. (CSCS); 1♀, **Russia** [RUSIA], Vladivostok, 27-VII-1997, leg. M. Deeche (USNM).

Distribution. China (Jilin, Liaoning); East Siberia, Japan.

Remarks. Taeger *et al*. (2010) synonymized this species with *P. rufonotalis* (Mallach, 1936) without any comment. The examination of the types of *Dipteromorpha ussuriensis* Malaise, 1931 shows that it is a distinct species. See the above key for the differences between *Propodea ussuriensis* (Malaise, 1931) and *Propodea rufonotalis* (Mallach, 1936).

6. ***Propodea rufonotalis* (Mallach, 1936)**, new combination

Tenthredo rufonotalis Mallach, 1936: 219.

Type specimen examined. Holotype not examined. The holotype should be in the Insect Collection of the Institute of Zoology, the Academy of Sciences, Beijing, China but it was not found there.

Other specimens examined. 3♀12♂, **China,** Hebei, Mt. Xiaowutaishan, Xigoumen, 1607 m, 15–16-VII-2007, Zejian LI leg.; 7♀16♂, Hebei, Mt. Xiaowutaishan, Xigoumen, 1607 m, 21–22-VII-2008, Zejian LI leg.; 7♀9♂, Hebei, Mt. Xiaowutaishan, Chiyabao, 1485 m, 24-VII-2008, Zejian LI leg.; 1♀1♂, Hebei, Mt. Xiaowutaishan, Chiyabao, 1400 m, 23-VI-2009, Xiaohua WANG leg.; 1♀1♂, Henan, Song County, Mt. Baiyunshan, 1500 m, 26-VII-2003, Yingke HE leg.; 1♀, Tsi Li Yu, Chansi, S. O. [Shanxi], 2100 m, 28-VI-1935, E. Licent; 1♂, Yao Chan, Chansi, S. O. [Shanxi], 2178 m, 23-VIII-1935, E. Licent (CSCS). 1♀2♂ exchanged with SDEI; 1♀1♂ exchanged with USNM.1♀, [Shaanxi: Foping] Dadianzi, 1650–1800 m, 5 km N of Donghetai, 26-VI-1997, A. Nakanishi col.(KUK).

Distribution. China (Shanxi, Shaanxi, Hebei, Beijing, Henan, Sichuan, Hunan).

Remarks. A long series of specimens collected from Hebei Province, which is near the type locality of *Tenthredo rufonotalis* Mallach, 1936, are compared carefully with the original description of *Tenthredo rufonotalis* Mallach and confirmed that they are *Propodea rufonotalis* (Mallach, 1936). See the above key for the differences between *Propodea ussuriensis* (Malaise, 1931) and *Propodea rufonotalis* (Mallach, 1936). The structure of head, thorax and the first abdominal tergite shows clearly that *Tenthredo rufonotalis* Mallach is a member of *Propodea*. So, the new combination is proposed here.

7. ***Propodea spinosa* (Cameron, 1899)**, new record to Nepal

Tenthredo spinosa Cameron, 1899: 12.

Jermakia dentisterna Rohwer, 1921: 97.

Type specimen examined. Holotype not examined.

Other specimens examined. 1♀1♂, **China,** Sichuan, Mt. Emeishan, 32 km, 1516 m, 24-V-2014, Ping HU & Ting LIU leg.; 1♀1♂, Zhejiang, Anji, Mt. Longwangshan, 31-VIII-1993, Junhua HE & Xuexin CHEN leg.; 2♀, Zhejiang, Mt. Tianmushan, 03-VIII-1984, Lirong SHEN; 1♂, Hunan, Yongzhou, Mt. Shunhuangshan, 900–1200 m, 28-IV-2004, Yang LIN leg.; 2♀4♂, Guangxi, Tianlin, car parking, 1875 m, 29-IV-2012, Meicai WEI, Gengyun NIU leg.; 3♀, Guizhou, Xishui, Lin River, 01-VI-2000, Wei XIAO leg.; 1♂, Guizhou, Zunyi, Dasha River, 1100 m, 22-V-2004, Yang LIN leg.; 1♀, Yunnan, Jinping, 1600 m, 25-V-1996, Jun leg.; 6♀2♂, Yunnan, Longling County, Mahuanghao, 670 m, 29-V-2009, Meicai WEI, Gengyun NIU leg.; 1♀, Yunnan, Mt. Gongshan, Heiwadi, 2000 m, 06-VI-2009, Wei XIAO leg.; 1♀, **Nepal,** Kathmandu, 2150 m, 24-VII-2013, Wei XIAO & Tao LI leg. (CSCS). 1♂, "N. E. **Myanmar**, Kambaiti, 7000 n., 25/5, R. MALAISE"; "*Dipteromorpha spinosa* (Cam.), Malaise det. 103"; "NRM Sthlm Loan, 2422/08". (NHRS).

Distribution. China (Sichuan, Zhejiang, Hunan, Guangxi, Guizhou, Yunnan); N. India; N. Myanmar; Nepal.

Remarks. This species can be easily recognized by the forewing with distinct yellowing tinge and without apical smoky macula, the clypeus yellow white, the mesothorax largely black, the hind femur and tibia reddish brown, the postocellar area strongly elevated and above top of ocelli.

Acknowledgements

Our cordial thanks are due to Dr. Hege Vårdal of the Natural History Museum, Stockholm, in lending us Malaise's types. We much appreciate the kind help of Dr. David R. Smith of National Museum of the Natural History, Smithsonian Institution, Washington, DC, USA, Dr. Andreas Teager, Dr. Stephen Blank and Mr. Andrew Liston of Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany, Dr. Akihiko Shinohara of the National Museum of Nature and Science, Japan, Dr. T. Naito of Kobe University, Kobe, Japan, Ms. Natalie Dale-Skey Papilloud of the British Museum of Natural History, London, England, Dr. L. Zombori of the Hungarian Natural History Museum, Budapest, Hungary, and Dr. M. Ohara of the Systematic Entomology, Hokkaido University, Sapporo, Japan, for their kind help when the last author visited their laboratories and collections. This research was supported by the National Natural Science Foundation of China (31501885, 31672344).

References

Cameron P. 1876. Descriptions of new genera and species of Tenthredinidae and Siricidae, chiefly from the East Indies, in the Collection of the British Museum. *Transaction of the Entomological Society*, 3: 459–471.

Cameron P. 1899. Hymenoptera Orientala or Contributions to a knowledge of the Hymenoptera of the Oriental Zoological Region. Part VIII. The Hymenoptera of the Khasia Hills. First Paper. *Memoirs and proceedings of the Manchester Literary and Philosophical Society*, 43(3): 1–220.

Goulet H. 1996. Revision of the Nearctic species of the *arcuata* group of the genus *Tenthredo* with notes on the higher classification of the Tenthredinini (Hymenoptera, Symphyta, Tenthredinidae). *Contributions of the American Entomological Institute, Gainesville*, 29(2): 1–135.

Kirby WF. 1882. *List of Hymenoptera, with description and figures of the typical specimens in the British Museum, I. Tenthredinidae and Siricidae.* London, vol. 1. 450 pp.

Malaise R. 1931. Blattwespen aus Wladiwostok und anderen Teilen Ostasiens. *Entomologische Tidskrift*, 51: 97–159.

Malaise R. 1945. Tenthredinoidea of South-Eastern Asia with a general zoogeographical review. *Opuscula Entomologica* (supplement), 4: 1–288.

Mallach N. 1936. Beitrag zur kenntnis der Blattwespenfaune Chinas. *Bulletin of the Fan Memorial Institute of*

Biology, Zoology, Peiping, 6(5): 217–222.

Matsumura S. 1912. *Thousand insects of Japan. Supplement IV*. Keiseisha, Tokyo, 247 pp.

Mocsáry A. 1909. Chalastogastra nova in collectione Musei nationalis Hungarici. *Annales Historico-Naturales Musei Nationalis Hungarici*, *Budapest*, 7: 1–39.

Rohwer SA. 1921. Notes on sawflies, with descriptions of new genera and species. *Proceedings of United States Natural Museum*, 59: 83–109.

Ross HH. 1945. Sawfly genitalia: terminology and study techniques. *Entomological News*, 61(10): 261–268.

Saini MS. 2007. *Indian Sawflies Biodiversity. Keys, Catalogue & Illustrations. Vol. 2.* Bishen Singh Mahendra Pal Singh, Dehra Dun, 234 pp.

Taeger A, Blank SM & Liston AD. 2010. World Catalog of Symphyta (Hymenoptera). *Zootaxa*, *Monograph*, 2580: 1–1064.

Viitasaari M. 2002. The Suborder Symphyta of Hymenoptera. *In:* Viitasaari M (Ed.), *Sawflies 1* (*Hymenoptera, Sympyta*). Tremex Press, Helsinki, pp. 11–174.

Wei MC & Lin Y. 2005. Hymenoptera: Argidae, Cimbicidae and Tenthredinidae. *In*: Yang MF & Jin DC (Eds.), *Insects from Dashahe Nature Reserve of Guizhou*. Guizhou Peoples Publishing House, Guiyang, pp. 428–463.

Wei MC, Nie HY & Taeger A. 2006. Sawflies (Hymenoptera: Symphyta) of China. -Checklist and review of research. *In*: Blank SM, Schmidt S & Taeger A (Eds.). *Recent sawfly research: synthesis and prospects*. Goecke & Evers, Keltern, pp. 505–574.

Wei MC, Nie HY, Xiao W & Niu GY. 2008. List of sawflies from Henan Province, Hymenoptera: Tenthredinomorpha, Siricomorpha, Blasticotomorpha, Cephomorpha. *In*: Shen XC & Lu C (Eds.), *Insects of Baotianman National Nature Reserve*. (*The Fauna and Taxonomy of Insects in Henan, Vol. 6*). China Agricultural Science and Technology Press, Beijing, pp. 198–215.

Wei MC, Niu GY, Li ZJ, Zhong YH, Xiao W & Zhu X. 2016. Hymenoptera: “Symphyta”. *In*: Yang XK *et al.* (Eds.), *The Insects Fauna of Qinling Mountains*. Shaanxi Science and Technology Publishing House, Xi’an. In press.

Wei MC, Zhong YH & Chen M. 2002. Hymenoptera: Tenthredinomorpha, Blasticotomorpha, Siricomorpha, Cephomorpha. *In*: Shen XC & Zhao Y (Eds.), *Insects of the mountains Taihang and Tongbai regions*. (*The Fauna and Taxonomy of Insects in Henan, Vol. 5*). China Agricultural Science and Technology Press, Beijing, pp. 394–426.